

IN THE CLAIMS:

Please amend claims 1- 34 as follows:

1. (Currently Amended) ~~It~~ An *in vivo* tomography system with high axial and lateral resolution of the human retina, comprising:

- a Michelson interferometer, producing a full-field tomography setup by interference at coherence length (OCT) with a Z scanning,
- an input light source (~~S~~), arranged in an input arm of the interferometer,
- adaptive optical means, designed to correct wavefronts originating from the eye and directed to the eye, comprising a reference source (~~SLD~~), a deformable mirror (~~MD~~) and means of analysing the wave surface (~~SH~~),
- means of detection (~~CCD~~), arranged in an imaging arm of the interferometer, designed to produce an image from an interferometric measurement according to the OCT principle, and
- means of adjusting (~~LA2, LA3, LA4~~) the focussing of the means of analysis of the wave surface (~~SH~~),

~~characterized in that~~ wherein the means of adjusting the focussing are arranged to force the deformable mirror to adopt an additional curvature, so as to conjugate the input light source (~~S~~) and the means of detection (~~CCD~~) with a point at a predetermined depth in the retina, said means of adjustment being controlled in synchronism with the Z scanning of the OCT tomography setup.

2. (Currently Amended) ~~System~~ The system according to claim 1, characterized in that the adaptive optical means (~~MD, SLD, SH~~) are arranged between the Michelson interferometer and the eye to be examined (~~OEX~~).

3. (Currently Amended) ~~System~~ The system according to ~~one of~~ claims 1 or 2, characterized in that it also comprises claim 1, further comprising means for controlling the adaptive optical means (~~MD~~) based on wavefront measurements made downstream of said adaptive optical means on a point image of the reference source (~~SLD~~) produced on the retina of the eye.

4. (Currently Amended) ~~System~~ The system according to claim 3, characterized in that it also comprises further including means to introduce for introducing an additional light beam, independent of the measurement beam, focussed on the retina.

5. (Currently Amended) ~~System according to one of the preceding~~ The system according to claim 1, wherein the means of analysing the wave surface (~~SH~~) comprise an analyser of the Shack-Hartmann type.

6. (Currently Amended) ~~System according to one of the preceding~~ The system according to claim 1, further including means (CBC) to compensate for compensating for the effects of birefringence of the cornea, which are arranged in front of the eye (~~OEX~~).

7. (Currently Amended) ~~System according to any one of the~~ The system according to claim 1, wherein rectilinearly polarized light passes through the two arms of the interferometer.

8. (Currently Amended) ~~System~~ The system according to claim 7, characterized in that it also comprises further including a polarizing cube (~~CPR~~) in order to obtain two mutually perpendicular polarizations in each arm.

9. (Currently Amended) ~~System~~ The system according to claim 8, characterized in that wherein the two arms of the interferometer comprise means to switch for switching the polarization by 90 degrees between the outward and return legs.

10. (Currently Amended) ~~System~~ The system according to claim 9, ~~characterized in that wherein~~ the means ~~of for~~ switching the polarization comprise a quarter-wave plate (~~QOR, QOM~~).

11. (Currently Amended) ~~System according to one of claims 7 to 10, characterized in that~~ The system according to claim 7, wherein the interferometer is illuminated with linearly polarized light (~~S, P~~).

12. (Currently Amended) ~~System~~ The system according to ~~one of claims 7 to 11, characterized in that it also comprises~~ claim 7, further including means ~~effor~~ adjusting the orientation of the input rectilinear polarization (~~P~~), so as to obtain a predetermined division of the fluxes injected into the two arms of the interferometer.

13. (Currently Amended) ~~System~~ The system according to ~~elaims 6 and 10, characterized in that~~ claim 6, wherein the quarter-wave plate (~~QOM~~) is placed closest to the eye, before the birefringence compensation means.

14. (Currently Amended) ~~System~~ The system according to ~~one of the preceding claims, characterized in that it also comprises~~ claim 1, further including means of filtering the corneal reflection.

15. (Currently Amended) ~~System~~ The system according to claim 14, ~~characterized in that wherein~~ the means ~~of for~~ filtering the corneal reflection comprise a field diaphragm (~~DCM~~) arranged to diaphragm the essential component of the flux reflected by the cornea.

16. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it also comprises~~ The system according to claim 1, further including means of for tuning the adjustment to a given depth, through reaction of the adaptive optical means (MD) to an overall defocussing of the assembly constituted by the reference source (SLD) and the analyser means (SH).

17. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it also comprises~~ The system according to claim 1, further including an active target pattern (MAM).

18. (Currently Amended) ~~System according to any one of the preceding claims, characterized in that it also comprises~~ The system according to claim 1, further including means of for freezing the shape of the adaptive optical means (MD) for the duration of an exposure.

19. (Currently Amended) ~~System according to one of the preceding claims, characterized in that~~ The system according to claim 1, wherein the reference source (SLD) is arranged upstream of the adaptive optical means (MD).

20. (Currently Amended) ~~System according to one of claims 1 to 18, characterized in that~~ The system according to claim 1, wherein the reference source (SLD) is inserted into the optical path between the adaptive optical means (MD) and the eye to be examined (OEX).

21. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it comprises~~ The system according to claim 1, further including means (IRIS) for tracking the movement of the eye to be examined with the means of adjustment or detection.

22. (Currently Amended) ~~System according to one of the preceding claims, characterized in that it comprises~~The system according to claim 1, further including, in the measurement arm, means ~~effor~~ for compensating for the effects of the focal chromatism of the eye.

23. (Currently Amended) ~~System according to any one of the preceding claims, characterized in that it comprises~~The system according to claim 1, further including, in the reference arm, means of compensating for the dispersion of the path differences.

24. (Currently Amended) ~~#~~An *in vivo* tomography method with high axial and lateral resolution of the human retina, comprising:

- a full-field tomography by interference with low coherence length (OCT) with a Z scanning, using an input light source-(S),
- a production of an image of the retina by means of detection-(~~CCD~~), from an interferometric measurement according to the OCT principle,
- a correction of the wavefronts originating from the eye and reaching the eye, by adaptive optical means-(~~MD, SLD, SH~~), arranged between the interferometer and the eye, comprising an analysis of the wave surface on the retina, and
- an adjustment of the focussing of the wave surface analysis,

~~characterized in that~~ wherein the focussing adjustment is carried out so as to conjugate the input light source-(S) and the means of detection-(~~CCD~~) with a point of predetermined depth in the retina, in synchronism with the Z scanning of the OCT tomography.

25. (Currently Amended) ~~Method~~The method according to claim 24, ~~characterized in that~~wherein the interferometric measurement comprises a measurement of the contrast of the fringes without modulation by the method termed Wollaston.

26. (Currently Amended) ~~Method according to one of claims 24 or 25, characterized in that it also comprises~~ The method according to claim 24, further including a compensation for the effects of birefringence of the cornea.

27. (Currently Amended) ~~Method~~ The method according to claim 26, characterized in that it also comprises further including a linear polarization (CPA) of the reference source (SLD) and a switching of the polarization between the outward and return paths in the arms.

28. (Currently Amended) ~~Method according to one of claims 24 to 27, characterized in that it also comprises~~ The method according to claim 24, further including a filtering (DCM) of the corneal reflection.

29. (Currently Amended) ~~Method according to one of claims 24 to 28, characterized in that it also comprises~~ The method according to claim 24, further including a tuning the adjustment to a given depth, by controlling the adaptive optical means (MD) in reaction to an overall defocussing of the assembly constituted by the reference source (SLD) and the wave surface analyser means (SH).

30. (Currently Amended) ~~Method according to one of claims 24 to 29, characterized in that it also comprises~~ The method according to claim 24, further including an adjustment of the focussing of the wave surface analyser means (SH).

31. (Currently Amended) ~~Method according to one of claims 24 to 30, characterized in that it also comprises~~ The method according to claim 24, further including a freezing of the shape of the adaptive optical means (MD) for the duration of an exposure.

32. (Currently Amended) ~~Method according to one of claims 24 to 31, characterized in that it comprises~~The method according to claim 24, further including, in the measurement arm, a compensation for the effects of the focal chromatism of the eye.

33. (Currently Amended) ~~Method according to one of claims 24 to 32, characterized in that it comprises~~The method according to claim 24, further including, in the reference arm, a compensation for the dispersion of the path differences.

34. (Currently Amended) ~~Method according to one of claims 24 to 33, characterized in that it comprises~~The method according to claim 24, further including a command to the wavefront analyser (SH)-obliging it to work in defocussed mode.